5. Work on a One-Way or Divided Roadway

One Lane Closed

An example of a right lane closure is shown in Figure 16 (page 70) for a four-lane divided roadway.

Two Lanes Closed on a Four-Lane Roadway

Two lanes of a multiple lane roadway can be closed by using two separate tapers and separating them by a distance of 2L where L is the minimum length of taper. The right lane is closed first, and after a distance of 2L, the taper closing the inside lane is begun. Careful analysis of roadway capacity should be made first. This type of closure is usually limited to non-peak hours of traffic.

Center Lane Closed on a Three-Lane Roadway

To close the center lane traffic must first be channelized out of the left lane (or right lane) and into the center lane. Then, traffic in the center lane can be directed around the work area by a second taper.

6. Mobile Operations

Mobile operations are work activities that make frequent short stops, up to a15-minute period, such as litter cleanup or pothole patching, and are similar to stationary operations. Warning signs, flashing vehicle lights, flags, and/or channelizing devices should be used.

Safety should not be compromised by using fewer devices simply because the operation will change its location frequently. Portable devices should be used. Flaggers may be used but caution must be taken so they are not exposed to unnecessary hazards. The control devices should be moved periodically to keep them near the work area. If mobile operations are in effect on a high speed travel lane, flashing arrow panels should be used.

7. Moving Operations

Moving operations are work activities where workers and equipment move along the road without stopping, usually at slow speeds. The advance warning area moves with the work area. Traffic should be directed to pass safely. Parking may be prohibited and work should be scheduled during off-peak hours. For some moving

operations, such as street sweeping, if volumes are light and sight distances are good, a well marked and signed vehicle may suffice. If volumes and/or speeds are higher, a shadow or backup vehicle equipped as a sign truck, preferably equipped with a flashing arrow panel, should follow the work vehicle. Where feasible, warning signs should be placed along the road and periodically moved as the work progresses. In addition, vehicles may be equipped with flags, flashing vehicle lights, and appropriate signs. See Figure 19 (page 75) for one example of using a shadow vehicle for a moving operation. Actual conditions may change the signs and devices needed.

8. Short-Term Utility Operations

Despite the shortness of "short-term"operations, certain traffic controls are necessary.

In urban areas, the work vehicle may be used for warning if it is equipped with flashing lights, rotating beacons, or flags.

Figures 20, 21, 22, and 23 are specifically included as typical applications for utility operations. Other typical applications may apply as well.

When entering or leaving a manhole, workers should always face oncoming traffic, so that they can get out of the way if necessary. Materials or equipment should be stored away from the manhole opening.

9. Urban Areas

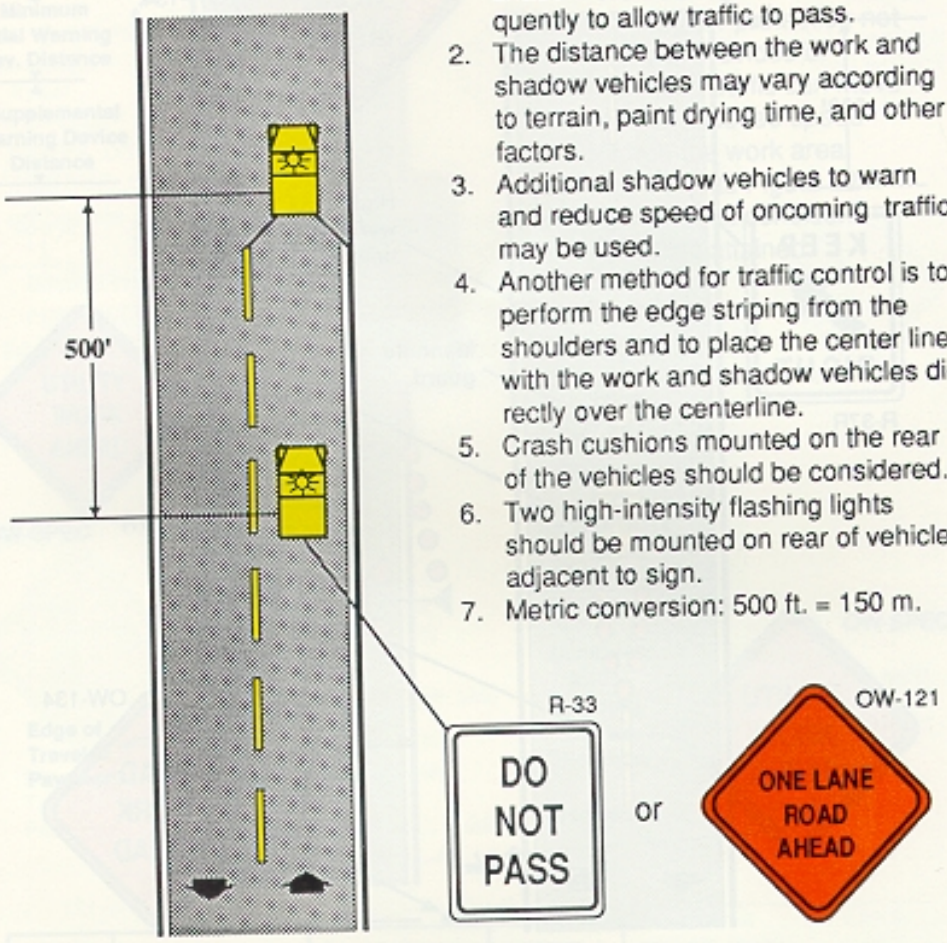
Urban traffic control zones may be subdivided into segments. Decisions must be reached as to how to control vehicular traffic; how many lanes are required; or whether any turns should be prohibited at intersections. Pedestrian traffic must be considered. If work will be done on the sidewalk, will it be necessary to close the sidewalk and assign the pedestrians to another path? (See Figure 24, page 80, for an example.) Next, decisions must be reached as to how to maintain access to business, industrial and residential areas. Even if the road is closed to vehicles, pedestrian access and walkways should be provided.

TYPICAL APPLICATION OF
TRAFFIC CONTROL DEVICES
FOR

USING A SHADOW VEHICLE FOR ADVANCE WARNING

NOTES:

1. With this type of control, the work and shadow vehicles should pull over frequently to allow traffic to pass.
2. The distance between the work and shadow vehicles may vary according to terrain, paint drying time, and other factors.
3. Additional shadow vehicles to warn and reduce speed of oncoming traffic may be used.
4. Another method for traffic control is to perform the edge striping from the shoulders and to place the center line with the work and shadow vehicles directly over the centerline.
5. Crash cushions mounted on the rear of the vehicles should be considered.
6. Two high-intensity flashing lights should be mounted on rear of vehicles adjacent to sign.
7. Metric conversion: 500 ft. = 150 m.

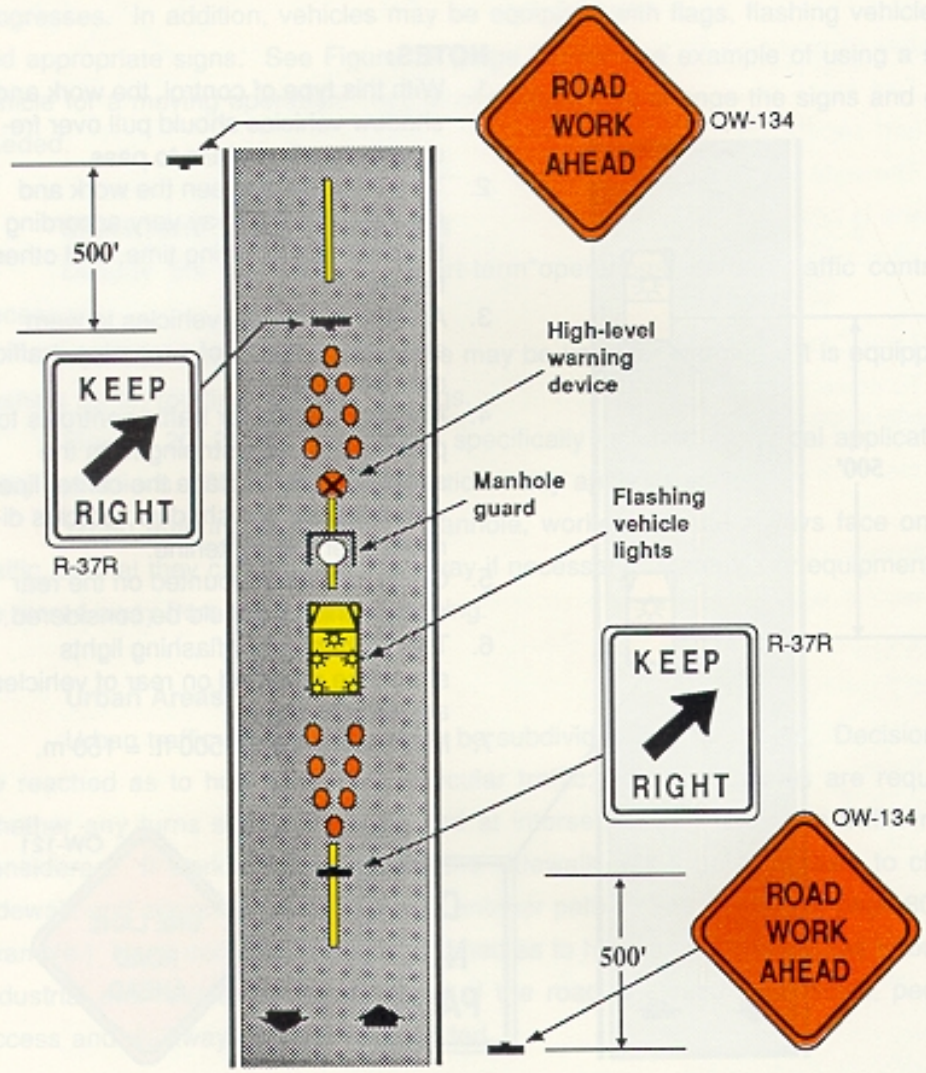


KEY: Flashing vehicle light

Figure 19

TYPICAL APPLICATION OF
TRAFFIC CONTROL DEVICES
FOR A

SHORT TERM UTILITY OPERATION IN AN URBAN LOCATION

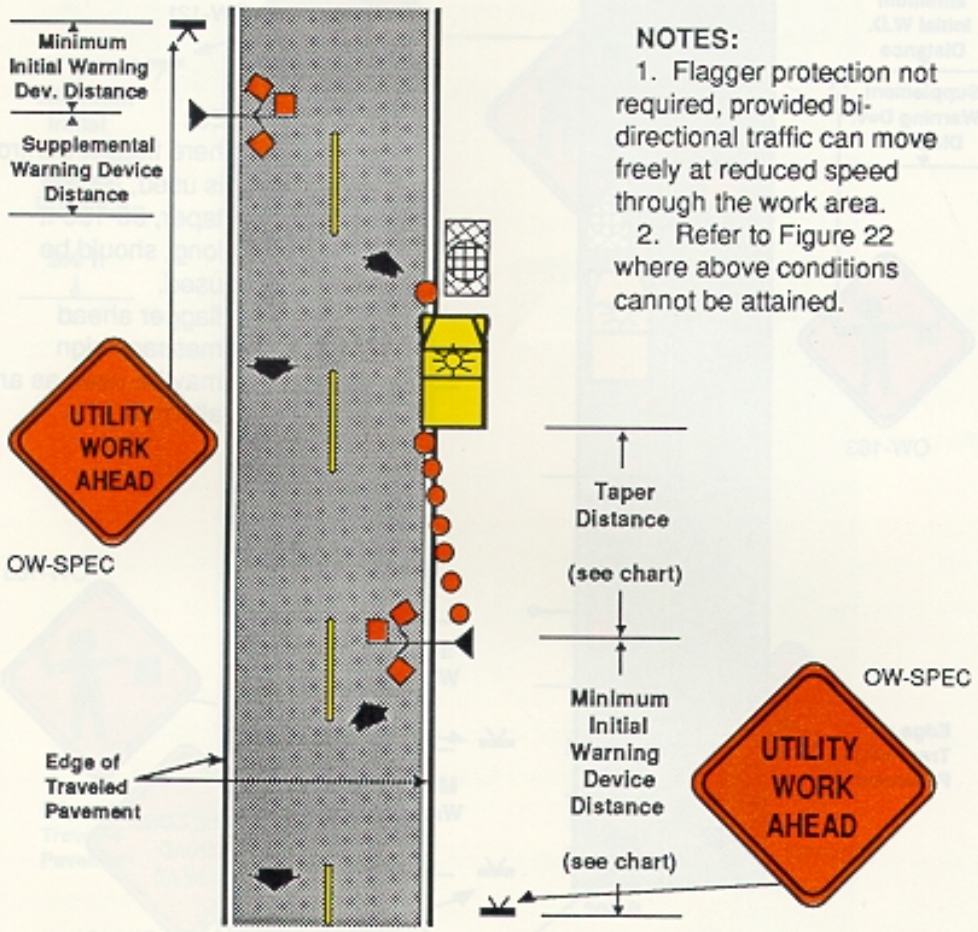


NOTES:

1. Additional advance warning may be used.
2. Metric conversion: 500 ft. = 150 m.

Figure 20

TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES FOR A UTILITY WORK ZONE ON A TWO-LANE ROADWAY WITH LOW TRAFFIC VOLUME



NOTES:

1. Flagger protection not required, provided bi-directional traffic can move freely at reduced speed through the work area.
2. Refer to Figure 22 where above conditions cannot be attained.

SPEED LIMIT	MINIMUM * INITIAL WARNING	SUPPLEMENTAL WARNING	TAPER DISTANCE
0 - 25	200 ft	200 ft.	125 ft.
26 - 35	300 ft.	300 ft.	250 ft.
36 - 50	500 ft.	400 ft.	600 ft.
over 50	1,000 ft.	500 ft.	660 ft.

*MUTCD requires an advance warning distance of 1,500 ft. on rural or open highway conditions.

Figure 21